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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,625	12/17/2001	Tohru Takahashi	217193US2S	7548

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EXAMINER

COLON, GERMAN

ART UNIT PAPER NUMBER

2879

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant N .

10/015,625

Applicant(s)

TAKAHASHI ET AL.

Examiner

German Colón

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4 is/are rejected.
- 7) ☒ Claim(s) 3 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Amendment, filed on April 24, 2003, has been entered and acknowledged by the Examiner.
2. Cancellation of claims 2 and 5 has been entered.

Claim Objections

3. Claim 3 is objected to because of the following informalities:

Lines 8 and 9 refer to "a distance of 2U3" and "a range 0.5 ± 116 ", respectively.

No reference "2U3" or " 0.5 ± 116 " is disclosed in the specification. For the purpose of examination said references were considered as " $2L/3$ " and " $0.5 \pm 1/6$ ".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerner (US 3,707,640) in view of Simpson et al. (US 5,730,887).

Regarding claim 1, Lerner discloses a shadow mask comprising:

a mask body including a substantially rectangular effective area having a minor axis and a major axis extending at right angles to each other; and

a large number of electron beam passage apertures 11 formed in the effective area,

each of the electron beam passage apertures 11 being formed of a communication hole connecting a larger hole opening 11b in one surface of the effective area and a smaller hole opening 11a in the other surface of the effective area,

in a cross section of the mask body in the major axis direction, a joint portion between the larger and smaller holes of each of at least the electron beam passage apertures in the central portion of the effective area being situated in a central portion in the thickness-direction of the mask body within a range of $0.5 \pm 1/6$ (see Fig. 2 and Col. 4, lines 36-38), when the thickness of the mask body is represented by 1,

in a cross section of the mask body in the major axis direction, a joint portion between the larger holes and smaller holes of each of the apertures located on the major axis and in the peripheral portion of the effective area being situated closer to one of the surface sides of the effective area than the joint portion of each of the electron beam passage apertures in the central portion of the effective area (see Fig. 2a and Col. 4, lines 46-50).

Lerner fails to disclose "the larger hole being offset against the smaller hole in the direction of the major axis.

However, in the same field of endeavor, Simpson discloses a shadow mask with a plurality of apertures where the larger hole on one surface side of the mask is offset against a smaller hole on the other surface side in the peripheral portion of said mask with

Art Unit: 2879

the purpose of increasing the clearance for electron beams passing through the apertures, preventing an incident electron beam from striking the peripheral portion of the mask surrounding the aperture (see Col. 1, lines 42-43 and Col. 4, lines 10-11). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to “offset the larger hole opening against the smaller hole opening in the direction of the major axis” in order to increase the clearance for electron beams passing through the apertures, preventing an incident electron beam from striking the peripheral portion of the mask surrounding the aperture.

Referring to claim 4, Lerner discloses a CRT comprising:

an envelope including a substantially rectangular face panel having a phosphor screen in the inner surface thereof (see Col. 3, lines 12-16);

a shadow mask opposed to the phosphor screen,

the mask body including a substantially rectangular effective area having a minor axis and a major axis extending at right angles to each other; and

a large number of electron beam passage apertures 11 formed in the effective area,

each of the electron beam passage apertures 11 being formed of a communication hole connecting a larger hole opening 11b in one surface of the effective area and a smaller hole opening 11a in the other surface of the effective area,

in a cross section of the mask body in the major axis direction, a joint portion between the larger and smaller holes of each of at least the electron beam passage apertures in the central portion of the effective area being situated in a central portion in

Art Unit: 2879

the thickness-direction of the mask body within a range of $0.5 \pm 1/6$ (see Fig. 2 and Col. 4, lines 36-38), when the thickness of the mask body is represented by 1,

in a cross section of the mask body in the major axis direction, a joint portion between the larger holes and smaller holes of each of the apertures located in the major axis and in the peripheral portion of the effective area being situated closer to one of the surface sides of the effective area than the joint portion of each of the electron beam passage apertures in the central portion of the effective area (see Fig. 2a and Col. 4, lines 46-50).

Lerner fails to disclose “the larger hole being offset against the smaller hole in the direction of the major axis.

However, in the same field of endeavor, Simpson discloses a shadow mask with a plurality of apertures where the larger hole on one surface side of the mask is offset against a smaller hole on the other surface side in the peripheral portion of said mask with the purpose of increasing the clearance for electron beams passing through the apertures, preventing an incident electron beam from striking the peripheral portion of the mask surrounding the aperture (see Col. 1, lines 42-43 and Col. 4, lines 10-11). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to “offset the larger hole opening against the smaller hole opening in the direction of the major axis” in order to increase the clearance for electron beams passing through the apertures, preventing an incident electron beam from striking the peripheral portion of the mask surrounding the aperture.

Allowable Subject Matter

6. Claims 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The Examiner notes that the Prior Art of Record discloses a mask body including a large number of electron beam passage apertures, each of the electron beam passage apertures being formed of a communication hole connecting a larger hole opening in one surface of the effective area and a smaller hole opening in the other surface of the effective area; wherein in a cross section of the mask body in the major axis direction, a joint portion between the larger and smaller holes of each of at least the electron beam passage apertures in the central portion of the effective area is situated in a central portion in the thickness-direction of the mask body within a range of $0.5 \pm 1/6$, when the thickness of the mask body is represented by 1; and, in a cross section of the mask body in the major axis direction, a joint portion between the larger holes and smaller holes of each of the apertures located on the major axis and in the peripheral portion of the effective area is situated closer to one of the surface sides of the effective area than the joint portion of each of the electron beam passage apertures in the central portion of the effective area; the mask being constructed so that the joint portion between the larger holes and the smaller holes varies with radial distance from the center of the effective area of the mask.

Regarding claim 3, the references of the Prior Art of Record fail to teach or suggest the combination of the limitations as set forth in claim 3, and specifically comprising the limitation of “each of the electron beam passage apertures in a region between the minor axis of the effective area and a position of $2L/3$ in the mayor-axis direction being situated within the range of $0.5 \pm 1/6$ in the thickness direction”. By establishing this region, the difference in strength between the central and peripheral portions of the effective area of the mask can be lessened to reduce deformation of the central portion, without increasing its thickness.

Referring to claim 6, claim 6 is allowable for the reasons stated in claim 3.

Response to Arguments

8. Applicant's arguments filed April 24, 2003 have been fully considered but they are not persuasive.

9. Applicants argue that Lerner (US 3,707,640) does not teach a specific location for the joint portion between the small-diameter portion and the large-diameter portion.

However, Lerner discloses (see Col. 4, lines 35-38 and lines 45-49) the small-diameter portion at the center of the effective area having a depth t_1 , not exceeding half the thickness of the mask, and the small-diameter portion at the periphery of the effective area having a depth t_2 .

Applicants argue that the teachings of Lerner do not reach the level of detail contained in the claimed invention.

The Examiner notes that claims 1 and 4 are related to a shadow mask wherein (1) “a joint portion between the larger and smaller holes of the apertures in the central

portion of the effective area is situated in a central portion in the thickness-direction within a range of $0.5 \pm 1/6$ ", and (2) "a joint portion between the larger holes and smaller holes of each of the apertures located in the major axis and in the peripheral portion of the effective area is situated closer to one of the surface sides of the effective area". As conceded by Applicants' Remarks, page 6, lines 15-21, Lerner teaches (1) "a joint portion between the larger and smaller holes of the apertures in the central portion of the effective area having a maximum depth t_1 , not exceeding half the thickness of the mask (i.e. in a range $t_1 \leq 0.5$)" and (2) "a joint portion between the larger holes and smaller holes of each of the apertures located in the major axis and in the peripheral portion of the effective area being situated closer to one of the surface sides of the effective area (i.e. a depth t_2 , which decreases with radial displacement)".

Applicants argue that Lerner discloses a preferred embodiment where the thickness $T \approx 15\text{mm}$, and the depth $t_1 \approx 4\text{mm}$. Accordingly, the joint portion is approximately 0.267 from the side d_1 . Applicants cited Lerner, Col. 6, lines 9-20, and concluded that Lerner fails to teach a joint portion between the larger and smaller holes of the apertures in the central portion of the effective area being situated in a central portion in the thickness-direction within a range of $0.5 \pm 1/6$.

The Examiner notes that Lerner does not disclose a preferred embodiment where the thickness $T \approx 15\text{mm}$, and the depth $t_1 \approx 4\text{mm}$. In Col. 6, lines 9-20, no reference is made to the thickness of the mask. Col. 6, lines 13-14, refer to a thickness of 2 mils at the center of the field (t_1) and a thickness of 1 mil at an edge of the field (t_2). Lerner discloses (see Col. 3, line 53) the shadow mask having a thickness of 6 to 7 mils.

Art Unit: 2879

Therefore, Lerner teaches a joint portion (t_1) having a thickness of $2/6$ (i.e. $0.5 - 1/6$), which lies in the claimed range.

For the reasons stated above the rejection of claims 1 and 4 is deemed proper.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to German Colón whose telephone number is 703-305-5987. The examiner can normally be reached on Monday thru Friday, from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 703-305-4794. The fax phone numbers for

Art Unit: 2879

the organization where this application or proceeding is assigned are 703-308-7382 for regular communications and 703-308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


gc

June 30, 2003



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